

PROJECT DESCRIPTION

EXPLORATION OF A LANDSLIDE ON I-275 IN HAMILTON COUNTY.

HISTORIC RECORDS

NO HISTORIC BORING RECORDS WERE FOUND WITHIN THE LANDSLIDE AREA.

GEOLOGY

THE SITE IS LOCATED ON THE WESTERN SIDE OF THE UPLANDS BETWEEN THE WHITEWATER AND GREAT MIAMI RIVERS, WHERE THE UPLANDS MEET THE WHITEWATER RIVER FLOOD PLAIN. DRY FORK CREEK IS LOCATED JUST WEST OF THE LANDSLIDE SITE. EMBANKMENT CONSTRUCTION FOR THE EXISTING WESTBOUND LANES OF I-275 HAVE IMPACTED THE SOIL CONDITIONS IN THE LANDSLIDE AREA.

DEEP TO MODERATELY DEEP ALLUVIAL AND OUTWASH SOILS ARE PRESENT WITHIN THE FLOOD PLAIN TO THE UNDERLYING ORDOVICIAN AGE SHALE AND LIMESTONE BEDROCK. RELATIVELY SHALLOW GLACIAL AND RESIDUAL SOILS ARE PRESENT TO THE UNDERLYING ORDOVICIAN AGE SHALE AND LIMESTONE BEDROCK IN THE UPLAND AREA. EMBANKMENT FILL SOILS ARE PRESENT OVERLYING THE NATURAL SOILS, WHERE EMBANKMENT CONSTRUCTION WAS PERFORMED FOR THE EXISTING I-275 CONSTRUCTION.

REVIEW OF 1971 CONSTRUCTION PLANS INDICATE THERE WAS A PREVIOUS EAST-WEST ORIENTED DRAINAGE WAY LOCATED NEAR STATION 281+00.

RECONNAISSANCE

HCN PERSONNEL VISITED THE SITE ON OCTOBER 5, 2011 AND AGAIN ON AUGUST 25, 2012. A CRESCENT SHAPED CRACK WAS OBSERVED IN THE WEST SHOULDER OF THE PAVEMENT BETWEEN APPROXIMATELY STATIONS 281+90 TO 282+45 IN OCTOBER 2011. IN AUGUST 2012, AN ASPHALT PATCH WAS OBSERVED IN THE AREA OF THE CRACK, AND THE CRESCENT SHAPED CRACK HAS REAPPEARED THROUGH THE EXISTING PAVEMENT PATCH. THE TOP ELEVATION OF THE GUARDRAIL WAS OBSERVED TO HAVE SETTLED DURING BOTH SITE VISITS. SOME TREES WERE OBSERVED TO BE LEANING TOWARD THE TOE OF THE EMBANKMENT SIDESLOPE WITHIN THE LANDSLIDE AREA. NO DEFINED TOE BULGE WAS OBSERVED DURING EITHER SITE VISIT.

THE LAND USAGE AROUND THE PROJECT CONSISTS OF THE WOODED AREAS BETWEEN THE INTERSTATE AND DRY FORK CREEK. THE LAND USE TO THE WET OF DRY FORK CREEK IS COMMERCIAL AND IS USED AS A SAND AND GRAVEL PIT MINING OPERATION. GRADES WITHIN THE LANDSLIDE AREA SLOPE FROM EAST TO WEST AND CONSIST OF THE EXISITNG HIGHWAY EMBANKMENT. THE EXISTING EMBANKMENT SIDESLOPE RANGES IN STEEPNESS FROM APPROXIMATLEY 2.2H:1V TO 2.5H:1V AND HAS A SLOPE HEIGHT OF BETWEEN 20 TO 25 FEET IN THE LANDSLIDE AREA. BEYOND THE TOE OF THE EXISTING HIGHWAY EMBANKMENT, THE GRADES FLATTEN TO APPROXIMATELY 6H:1V TO NEARLY LEVEL. NEAR STATION 281+00 BEYOND THE TOE OF THE EXISTING HIGHWAY EMBANKMENT, AN EAST-WEST ORIENTED DRAINAGE WAY WAS OBSERVED.

SUBSURFACE EXPLORATION

A TOTAL OF 5 TEST BORINGS, DESIGNATED AS B-001-0-11 TO B-005-0-11, WERE PERFORMED FOR THE LANDSLIDE AND ADJACENT CULVERT REPLACEMENT PROJECT BETWEEN OCTOBER 18 TO 26, 2011. THE TEST BORINGS WERE DRILLED USING A TRACK-MOUNTED DRILL RIG. THE DRILL RIG UTILIZED HOLLOW STEM AUGERS TO PERMIT SPLIT-SPOON SAMPLING. SAMPLES WERE OBTAINED AT 2.5 TO 5 FEET INTERVALS FOR THE FULL DEPTH OF THE SOIL PORTION OF THE BORINGS. DRILLING AND SAMPLING PROCEDURES WERE PERFORMED IN GENERAL ACCORDANCE WITH AASHTO T206, AND UNDISTURBED SAMPLES WERE OBTAINED AT THE DEPTHS SHOWN ON THE SOIL PROFILE IN GENERAL ACCORDANCE WITH AASTO T207. THE HAMMER SYSTEMS USED WERE MOST RECENTLY CALIBRATED ON SEPTEMBER 8, 2010. THE AVERAGE DRILL ROD ENERGY RATIO (ER) FOR THE DRILL RIG USED TO PERFORM THE TEST BORINGS WAS 83.7 PERCENT. BORINGS B-003-0-11 TO B-005-0-11 WERE ADVANCED INTO BEDROCK AND SAMPLED (AASHTO T225) USING NQ SIZE CORING EQUIPMENT.

EXPLORATION FINDINGS

THE TEST BORINGS DRILLED FOR THIS PROJECT GENERALLY ENCOUNTERED TOPSOIL AT THE EXISTING GROUND SURFACE. EXISTING EMBANKMENT FILL SOILS WERE ENCOUNTERED BELOW THE SURFICIAL MATERIALS AT THE TEST BORINGS. NATURAL INTERBEDDED GRANULAR AND COHESIVE SOILS OF GLACIAL, RESIDUAL, ALLUVIAL AND OUTWASH ORIGIN WERE ENCOUNTERED BELOW THE EXISTING EMBANKMENT FILL OR SURFICIAL SOILS. ORDOVICIAN AGE SHALE AND LIMESTONE BEDROCK WAS ENCOUNTERED AT THREE TEST BORINGS AT DEPTHS RANGING FROM 10 TO 25 FEET BELOW EXISTING GROUND SURFACE.

EXISTING EMBANKMENT FILL WAS ENCOUNTERED BELOW THE SURFICIAL MATERIALS AT TEST BORINGS B-001-0-11, B-002-0-11 AND B-005-0-11. THE FINE-GRAINED EXISTING FILL SOILS WERE CLASSIFIED AS SILTY CLAY (A-6B) OR CLAY (A-7-6). THE EXISTING EMBANKMENT SOILS CONTAINED SHALE AND LIMESTONE PIECES OR FRAGMENTS WITH SOME LIMESTONE FLOATERS.

AT BORING B-005-0-11 UNDERLYING THE SURFICIAL SOILS, GRANULAR ALLUVIAL AND OUTWASH SOILS WERE ENCOUNTERED TO A DEPTH OF 12.5 FEET BELOW EXISTING GROUND SURFACE. THESE GRANULAR SOILS WERE CLASSIFIED AS COARSE AND FINE SAND (A-3A) AND GRAVEL AND/OR STONE FRAGMENTS WITH SAND, SILT AND CLAY (A-2-6 OR A-2-7).

UNDERLYING THE EXISTING FILL OR SURFICIAL MATERIALS IN B-001-0-11 TO B-004-0-11 AND UNDERLYING THE NATURAL GRANULAR SOILS IN B-005-0-11, NATURAL FINE-GRAINED SOILS WERE ENCOUNTERED OF GLACIAL OR RESIDUAL ORIGIN. THE ENCOUNTERED NATURAL FINE-GRAINED SOILS WERE CLASSIFIED AS SILTY CLAY (A-6B) OR CLAY (A-7-6).

BEDROCK CONSISTING OF SHALE AND INTERBEDDED LIMESTONE WAS ENCOUNTERED AT VARYING ELEVATIONS IN BORINGS B-003-0-11 TO B-005-0-11. THE SHALE VARIED FROM HIGHLY WEATHERED TO MODERATELY WEATHERED AND WAS DESCRIBED AS VERY WEAK TO WEAK. THE LIMESTONE VARIED FROM SLIGHTLY TO MODERATELY WEATHERED AND WAS DESCRIBED AS MODERATELY STRONG.

GROUNDWATER DURING DRILLING WAS REPORTED AT EACH TEST BORING LOCATION. GROUNDWATER WAS ENCOUNTERED DURING DRILLING OPERATIONS ONLY IN BORINGS B-004-0-11 AND B-005-0-11. NO LONG-TERM WATER LEVELS WERE RECORDED.

LEGEND

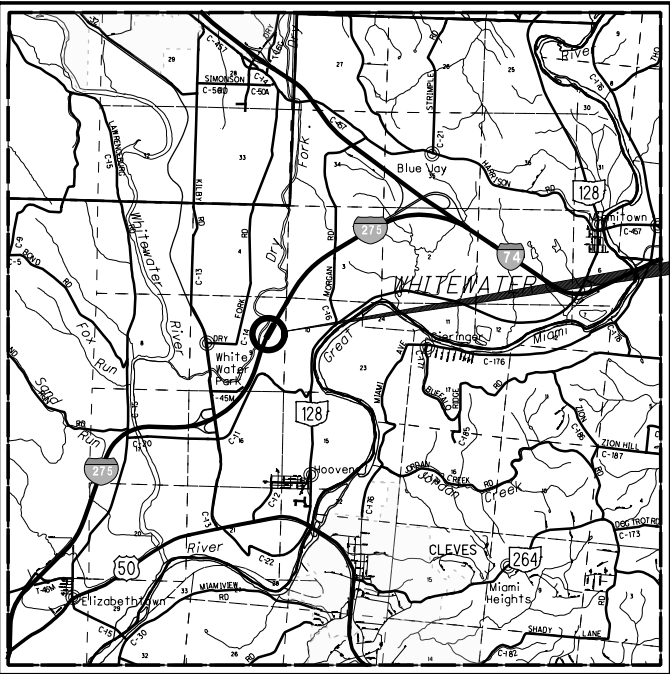
DESCRIPTION	ODOT CLASS	CLASSIFIED MECH./VISUAL	
GRAVEL/STONE FRAGMENTS W/ SAND & SILT	A-2-6	1	-
GRAVEL/STONE FRAGMENTS W/ SAND, SILT & CLAY	A-2-7	2	-
COARSE & FINE SAND	A-3a	1	-
SILTY CLAY	A-6b	3	3
CLAY	A-7-6	17	10
	TOTAL	24	13
INTERBEDDED SHALE & LIMESTONE	VISUAL		
INTERBEDDED SHALE & LIMESTONE WEATHERED	VISUAL		
BORING LOCATION - PLAN VIEW.			
INSTRUMENTAL BORING LOCATION - PLAN VIEW.			
DRIVE SAMPLE AND/OR ROCK CORE BORING PLOTTED TO VERTICAL SCALE ONLY. HORIZONTAL BAR INDICATES A CHANGE IN STRATIGRAPHY.			
WC	INDICATES WATER CONTENT IN PERCENT.		
N60	INDICATES STANDARD PENETRATION RESISTANCE NORMALIZED TO 60% DRILL ROD ENERGY RATIO.		
X/Y/Z	NUMBER OF BLOWS FOR STANDARD PENETRATION TEST (SPT): X= NUMBER OF BLOWS FOR FIRST 6 INCHES. Y= NUMBER OF BLOWS FOR SECOND 6 INCHES. Z= NUMBER OF BLOWS FOR THIRD 6 INCHES.		
W	INDICATES FREE WATER ELEVATION.		
INDICATES FREE WATER ELEVATION.			
SS	INDICATES A SPLIT SPOON SAMPLE.		
ST	INDICATES A SHELBY TUBE SAMPLE.		

SPECIFICATIONS

THIS GEOTECHNICAL EXPLORATION WAS PERFORMED IN ACCORDANCE WITH THE STATE OF OHIO, DEPARTMENT OF TRANSPORTATION, OFFICE OF GEOTECHNICAL ENGINEERING, SPECIFICATIONS FOR GEOTECHNICAL EXPLORATIONS, DATED MAY 2010.

AVAILABLE INFORMATION

ALL AVAILABLE SOIL AND BEDROCK INFORMATION THAT CAN BE CONVENIENTLY SHOWN ON THE GEOTECHNICAL EXPLORATION SHEETS HAS BEEN SO REPORTED. ADDITIONAL EXPLORATIONS MAY HAVE BEEN MADE TO STUDY SOME SPECIAL ASPECT OF THE PROJECT. COPIES OF THIS DATA, IF ANY, MAY BE INSPECTED IN THE DISTRICT DEPUTY DIRECTOR'S OFFICE, THE OFFICE OF GEOTECHNICAL ENGINEERING AT 1600 WEST BROAD STREET OR THE OFFICE OF STRUCTURAL ENGINEERING AT 1980 WEST BROAD STREET IN COLUMBUS, OHIO.

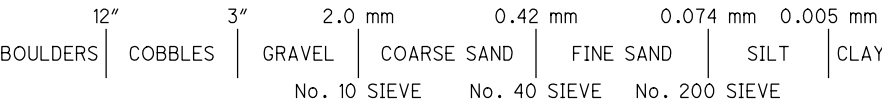


LOCATION MAP

SCALE IN MILES

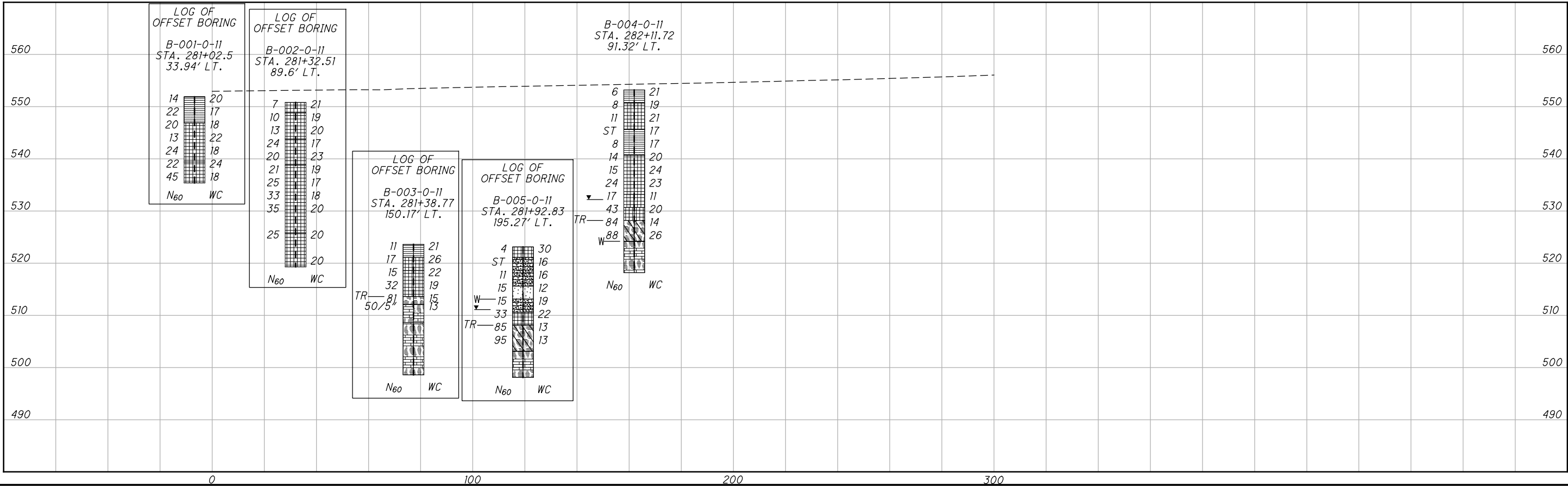
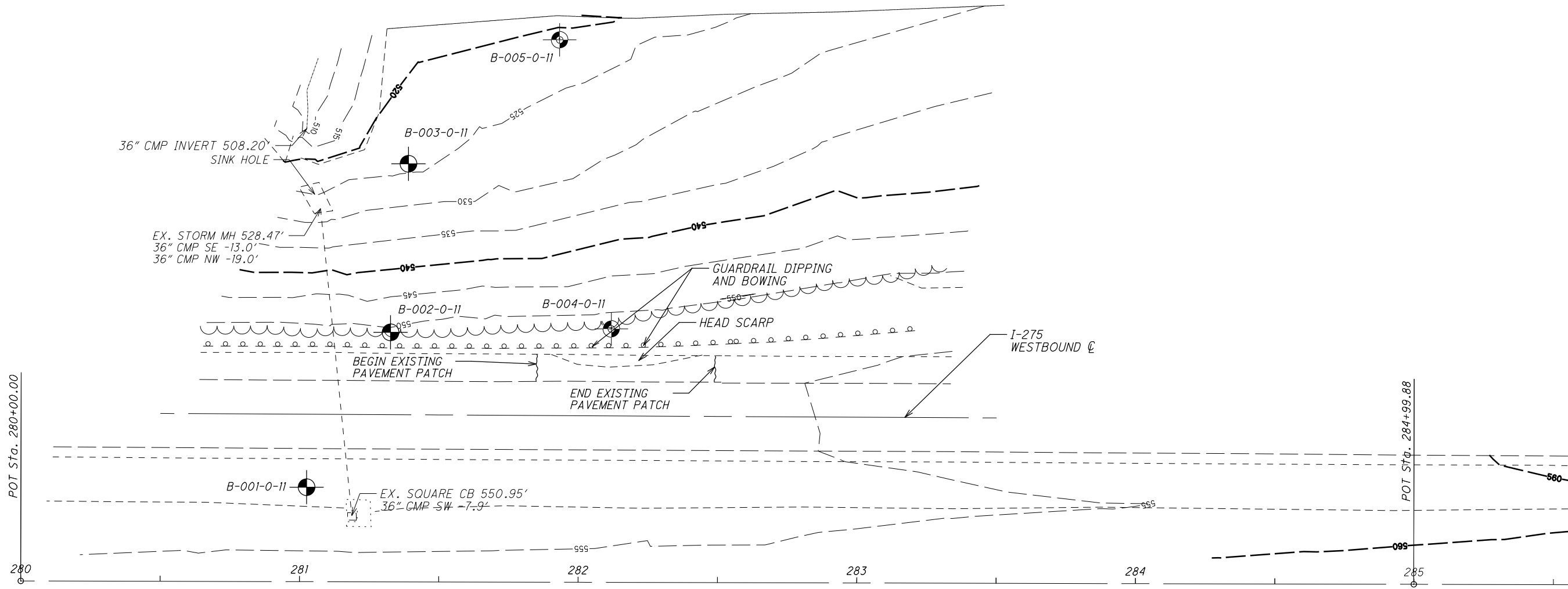


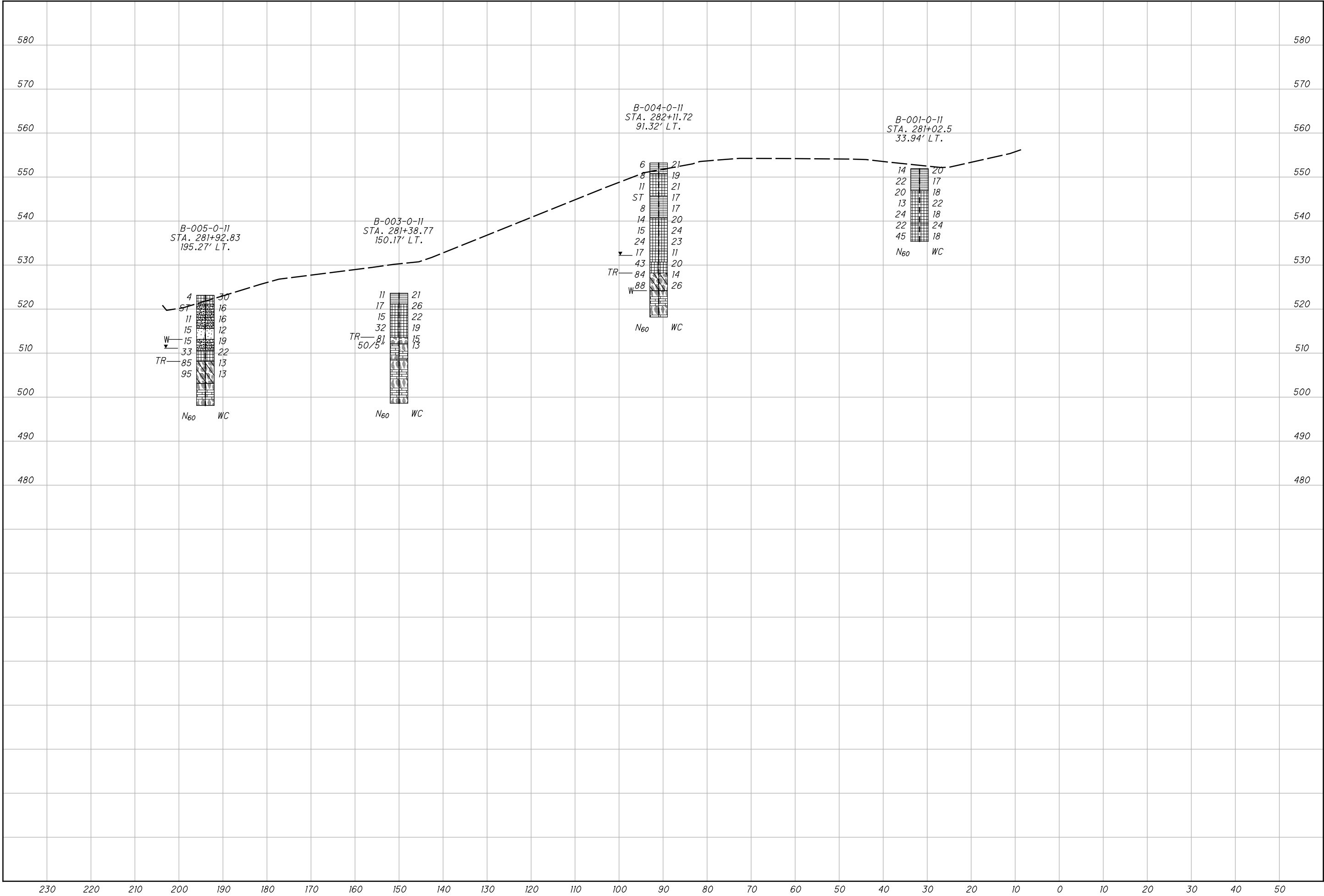
PARTICLE SIZE DEFINITIONS



RECON. - JDD 10/5/2011 JWW 8/25/2012
DRILLING - CJB 10/8/2011-10/26/2011
DRAWN - KJM 9/14/2012-9/17/2012
REVIEWED - JDD 9/18/2012

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LANDSLIDE EXPLORATION
CROSS SECTION STA. 282+10

HAM-275-5.28



DRAWN KJM
CHECKED JDD

PROJECT: HAM-275-5.28		DRILLING FIRM / OPERATOR: HCN / CJB		DRILL RIG: DIEDRICH D50 TRACK		STATION / OFFSET: 281+02.5, 33.94 LT		EXPLORATION ID	
TYPE: CULVERT REPLACEMENT		SAMPLING FIRM / LOGGER: HCN / JDD		HAMMER: DIEDRICH AUTOMATIC		ALIGNMENT: I-275		B-001-0-11	
PID: 92075 BR ID:		DRILLING METHOD: 3.25" HSA		CALIBRATION DATE: 9/8/10		ELEVATION: 551.9 (MSL) EOB: 16.5 ft.		PAGE	
START: 10/24/11 END: 10/24/11		SAMPLING METHOD: SPT		ENERGY RATIO (%): 83.7		COORD: 445926.127 N, 1326405.286 E		1 OF 1	
MATERIAL DESCRIPTION AND NOTES		ELEV.		REC SAMPLE ID		GRADATION (%)		ATTERBERG	
		551.9		N ₆₀		GR CS FS SI CL		LL PI WC	
VERY STIFF, BROWN, SOME GRAY, SILTY CLAY, LITTLE SHALE PIECES, TRACE LIMESTONE PIECES, TO FRAGMENTS, FINE ROOTS AND GRAVEL, (EMBANKMENT FILL), DAMP		DEPTHS		SPT/ RQD		3 4 3 42 48		20 19	
		1		4 6					
		2							
		3							
STIFF TO VERY STIFF, BROWN, LITTLE GRAY, CLAY, LITTLE SHALE PIECES, TRACE LIMESTONE PIECES, (EMBANKMENT FILL), DAMP		4		22 78 SS-2 4.00		- - - - - 17		A-6b (V)	
		5							
		6		20 100 SS-3 4.25		4 7 3 34 52 44 21 23		18	
		7							
VERY STIFF, BROWN AND GRAY, TRACE DARK BROWN, CLAY, TRACE SHALE PIECES, SAND, SMALL LIMESTONE FRAGMENTS AND FINE GRAVEL, DAMP		8		13 89 SS-4 1.50		- - - - - 22		A-7-6 (V)	
		9							
		10		24 100 SS-5 4.00		1 3 2 38 56 45 23 22		18	
		11							
		12							
		13		22 100 SS-6 3.00		- - - - - 24		A-7-6 (V)	
		14							
		15							
		16		45 100 SS-7 4.00		3 3 5 40 49		20 25	
		EOB							
		535.4						18	
								A-7-6 (15)	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SOIL CUTTINGS

PROJECT: HAM-275-5.28

TYPE: CULVERT REPLACEMENT

PID: 92075 BR ID:

START: 10/18/11 END: 10/18/11

DRILLING FIRM / OPERATOR: HCN / CJB

SAMPLING FIRM / LOGGER: HCN / JDD

DRILLING METHOD: 3.25" HSA

SAMPLING METHOD: SPT

MATERIAL DESCRIPTION AND NOTES

STIFF TO VERY STIFF, GRAY AND BROWN, CLAY, LITTLE TO SOME SHALE PIECES, LITTLE TO TRACE LIMESTONE PIECES TO FLOATERS (EMBANKMENT FILL), MOIST

VERY STIFF, BROWN TRACE GRAY, CLAY, TRACE GRAVEL, SHALE PIECES AND LIMESTONE PIECES, (EMBANKMENT FILL), MOIST

VERY STIFF, BROWN AND GRAY, CLAY, LITTLE SHALE PIECES, TRACE TO LITTLE LIMESTONE PIECES, TRACE GRAVEL (EMBANKMENT FILL), MOIST

VERY STIFF, BROWN, GRAY, AND DARK BROWN, CLAY, LITTLE SHALE PIECES, TRACE SMALL LIMESTONE PIECES, AND GRAVEL (EMBANKMENT FILL), MOIST

VERY STIFF, BROWN, LITTLE GRAY, CLAY, TRACE TO LITTLE ROCK PIECES, GRAVEL, AND SAND (EMBANKMENT FILL), MOIST

ELEV. 550.8

548.8

543.8

538.8

525.8

519.3

DEPTH 1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

26

27

28

29

30

31

SPT/ RQD 1

2

3

3

4

19

4

5

24

9

8

4

7

20

100

SS-5

4.00

1

5

2

45

47

43

23

20

23

A-7-6 (13)

7

6

21

100

SS-6

4.00

-

-

-

-

-

19

A-7-6 (V)

4

6

25

89

SS-7

3.00

4

10

3

37

46

41

19

22

17

A-7-6 (13)

8

12

33

67

SS-8

3.25

-

-

-

-

-

18

A-7-6 (V)

8

11

35

100

SS-9

4.25

-

-

-

-

-

20

A-7-6 (V)

8

9

25

78

SS-10

3.50

3

6

4

39

48

41

19

22

20

A-7-6 (13)

-

SS-11

4.00

-

-

-

-

-

20

A-7-6 (V)

DRILL RIG: DIEDRICH D50 TRACK HAMMER: DIEDRICH AUTOMATIC

CALIBRATION DATE: 9/8/10

ENERGY RATIO (%): 83.7

GRADATION (%) GR CS FS SI CL

ATTERBERG LL PL PI

WC

ODOT CLASS (g)

STATION / OFFSET: 281+32.51, 89.6 LT

ALIGNMENT: I-275

ELEVATION: 550.8 (MSL) EOB: 31.5 ft.

COORD: 445980.032 N, 1326372.228 E

EXPLORATION ID B-002-0-11

PAGE 1 OF 1

STANDARD ODOT SOIL BORING LOG (11 X 17) - OH DOT.GDT - 9/5/12 12:55 - N:\PROJECTS\2011\115271\WORKING FILES\LABORATORY-FIELD DATA-BORING LOGS\115271 TEST BORING LOGS.GPJ

NOTES: AREA CUT APPROX. 1 FT. FOR ACCESS.
ABANDONMENT METHODS, MATERIALS, QUANTITIES: SOIL CUTTINGS

PROJECT: HAM-275-5.28		DRILLING FIRM / OPERATOR: HCN / CJB		STATION / OFFSET: 281+38.77, 150.17 L		EXPLORATION ID B-003-0-11														
TYPE: CULVERT REPLACEMENT		SAMPLING FIRM / LOGGER: HCN / JDD		ALIGNMENT: I-275		PAGE 1 OF 1														
PID: 92075 BR ID: 10/18/11		DRILLING METHOD: 3.25" HSA / NQ2		ELEVATION: 523.6 (MSL) EOB: 25.0 ft																
START: 10/18/11 END: 10/18/11		SAMPLING METHOD: SPT / NQ2		COORD: 446015.857 N, 1326322.986 E																
MATERIAL DESCRIPTION AND NOTES				SPT/ RQD	N ₆₀	REC SAMPLE ID	HP (tsf)	GR	CS	FS	SI	CL	LL	PL	PI	WC	ODOT CLASS (g)	BACK FILL		
VERY STIFF, MOTTLED BROWN, LITTLE GRAY, SILTY CLAY, TRACE SAND, FINE GRAVEL AND FINE ROOTS, MOIST				4	5	11	67	SS-1	3.00	-	-	-	-	-	-	-	21	A-6b (V)		
VERY STIFF, BROWN, CLAY, LITTLE SAND AND FINE GRAVEL, TRACE ROOT HAIRS, MOIST				4	6	17	100	SS-2	3.00	10	13	10	20	47	54	20	34	26	A-7-6 (17)	
VERY STIFF, OLIVE-BROWN TO GRAYISH-BROWN, CLAY, TRACE INTERBEDDED SHALE SEAMS AND PIECES, MOIST				5	5	15	100	SS-3	3.50	0	2	2	33	63	51	23	28	22	A-7-6 (17)	
SHALE, BROWN, TRACE GRAY, HIGHLY WEATHERED, VERY WEAK, LAMINATED.				7	10	32	100	SS-4	4.00	-	-	-	-	-	-	-	19	A-7-6 (V)		
INTERBEDDED SHALE (50%) AND LIMESTONE (50%); SHALE, GRAY, MODERATELY WEATHERED, WEAK, LAMINATED; LIMESTONE, LIGHT GRAY, SLIGHTLY WEATHERED, MODERATELY STRONG, THIN BEDDED.				13	22	81	100	SS-5	-	-	-	-	-	-	-	-	15			
INTERBEDDED SHALE (90%) AND LIMESTONE (10%); SHALE, GRAY, MODERATELY WEATHERED, WEAK, LAMINATED; CALCAREOUS; LIMESTONE, LIGHT GRAY, SLIGHTLY WEATHERED, MODERATELY STRONG, THIN BEDDED, TRACE FRACTURES.				50/5"	-	100	SS-6	-	-	-	-	-	-	-	-	-	13			

STANDARD ODOT SOIL BORING LOG (11 X 17) - OH DOT.GDT - 9/6/12 12:56 - N:\PROJECTS\2011\11115271\WORKING FILES\LABORATORY-FIELD DATA-BORING LOGS\1115271 TEST BORING LOGS.GPJ

NOTES: AREA CUT 6" FOR ACCESS.
ABANDONMENT METHODS, MATERIALS, QUANTITIES: SOIL CUTTINGS

PROJECT: HAM-275-5.28 TYPE: LANDSLIDE			DRILLING FIRM / OPERATOR: HCN / CJB SAMPLING FIRM / LOGGER: HCN / JDD			DRILL RIG: DIEDRICH D50 TRACK HAMMER: DIEDRICH AUTOMATIC			STATION / OFFSET: 282+11.72, 91.32 LT			EXPLOSION ID B-004-0-11												
PID: 92075 BR ID:			DRILLING METHOD: 3.25" HSA / NQ2			CALIBRATION DATE: 9/8/10			ELEVATION: 553.2 (MSL) EOB: 35.0 ft.			PAGE 1 OF 1												
START: 10/26/11 END: 10/26/11			SAMPLING METHOD: SPT / NQ2			ENERGY RATIO (%): 83.7			COORD: 446049.397 N, 1326410.501 E															
MATERIAL DESCRIPTION AND NOTES			ELEV.	DEPTHS		SPT/ RQD	N ₆₀	REC SAMPLE (%)	HP ID (tsf)	GRADATION (%)				ATTERBERG				WC	ODOT CLASS (g)	HOLE SEALED				
VERY STIFF, GRAY, LITTLE BROWN, SILTY CLAY, LITTLE SHALE PIECES AND FRAGMENTS, TRACE SAND AND LIMESTONE PIECES, (FILL), DAMP			553.2		1	2	2	6	100	SS-1	2.50	1	3	3	43	50	40	21	19	21	A-6b (12)			
					2																			
					3	3	3	8	100	SS-2	2.50	6	2	3	44	45	41	21	20	19	A-7-6 (12)			
					4																			
					5																			
					6	3	3	11	67	SS-3	2.75	26	3	2	32	37	44	21	23	21	A-7-6 (13)			
STIFF, BROWN AND GRAY, SILTY CLAY, TRACE SAND, SHALE AND LIMESTONE PIECES, (FILL), DAMP			545.7		7																			
					8																			
					9																			
					10																			
					11	4	2	8	11	SS-5	3.00	-	-	-	-	-	-	-	-	17	A-6b (V)			
					12																			
VERY STIFF, BROWN AND GRAY, CLAY, LITTLE SHALE AND LIMESTONE PIECES, TRACE SAND, (FILL), MOIST			540.7		13	4	4	14	89	SS-6	2.75	6	4	6	38	46	42	19	23	20	A-7-6 (14)			
					14																			
					15	3	4	15	56	SS-7	3.00	7	4	3	34	52	45	21	24	24	A-7-6 (15)			
					16																			
					17																			
					18	4	4	24	78	SS-8	3.25	2	2	3	42	51	41	20	21	23	A-7-6 (13)			
STIFF, OLIVE-BROWN TRACE GRAY, CLAY, TRACE SHALE SEAMS AND PIECES, TRACE LIMESTONE PIECES, DAMP			533.2	▼	19																			
					20	2	4	17	89	SS-9	2.00	1	1	1	39	58	46	21	25	11	A-7-6 (15)			
					21																			
					22																			
					23	5	13	43	78	SS-10	4.25	1	1	3	36	59	47	23	24	20	A-7-6 (15)			
					24																			
VERY STIFF TO HARD, OLIVE-BROWN, CLAY, LITTLE SHALE SEAMS, DAMP			530.7		25																			
					26																			
					27																			
					28																			
					29																			
					30																			
SHALE, BROWN TRACE GRAY, HIGHLY WEATHERED, VERY WEAK, LAMINATED, FISSILE, TRACE LIMESTONE AND CLAY SEAMS BELOW 27.5'			528.2	TR	31	12	23	84	100	SS-11	-	-	-	-	-	-	-	-	14	Rock (V)				
					32																			
					33																			
					34																			
					35																			
					36																			
INTERBEDDED SHALE (95%) AND LIMESTONE (5%); SHALE, GRAY, MODERATELY WEATHERED, VERY WEAK TO WEAK, LAMINATED, FISSILE, TRACE CLAY SEAMS; LIMESTONE, LIGHT GRAY, LITTLE BROWN, MODERATELY WEATHERED, MODERATELY STRONG, THIN BEDDED, FRACTURED, FRACTURES IRON STAINED.			524.2	W	37	14	27	88	-	SS-12	-	-	-	-	-	-	-	26	Rock (V)					
					38																			
					39																			
					40																			
					41																			
					42																			

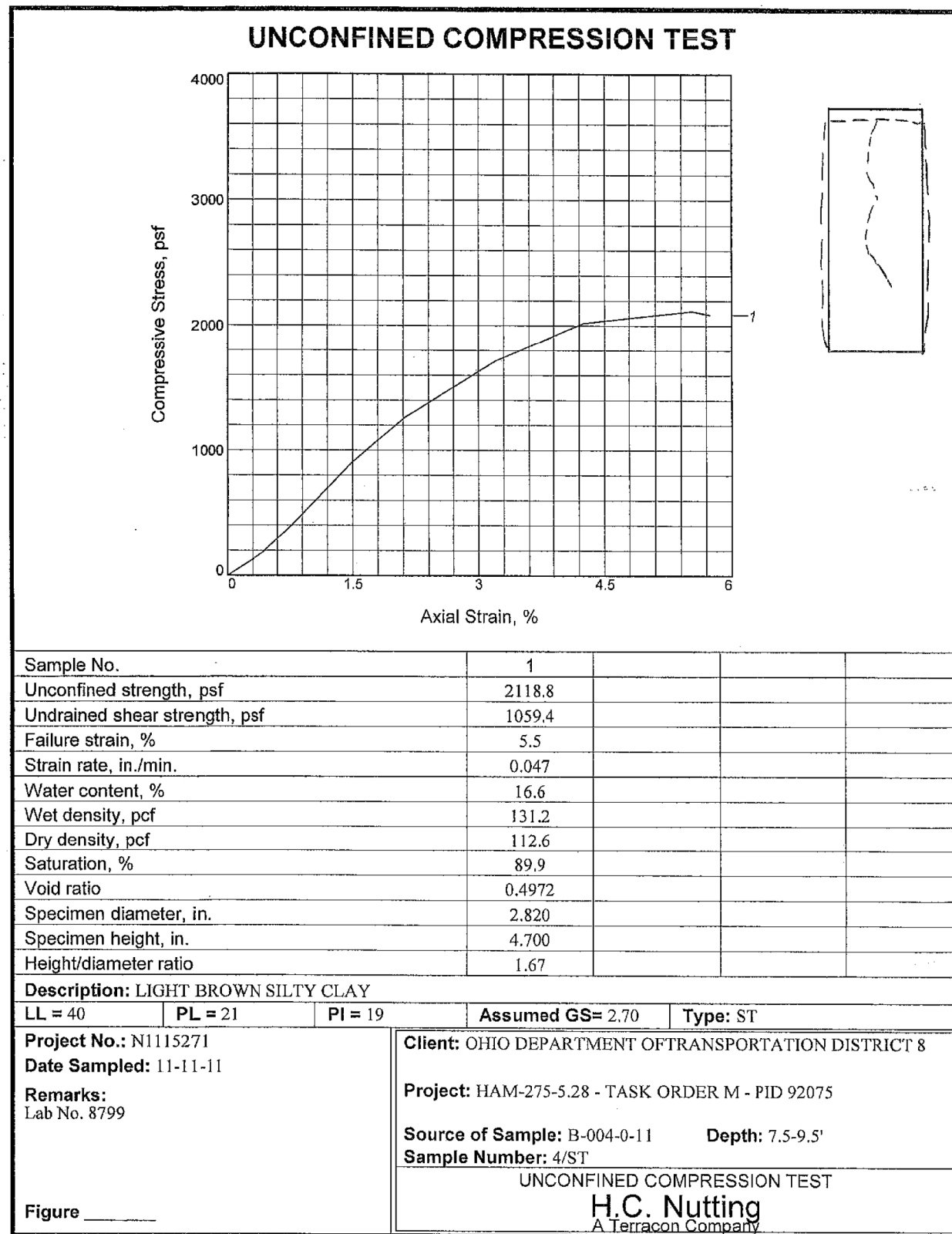
STANDARD ODOT SOIL BORING LOG (11 X 17) - OH DOT.GDT - 9/17/12 08:42 - N:\PROJECTS\2011\111\11527\1\WORKING FILES\LABORATORY\FIELD DATA-BORING LOGS\1115271 LANDSLIDE LOGS.GPJ

NOTES: INCLINOMETER SET UPON COMPLETION.
ABANDONMENT METHODS, MATERIALS, QUANTITIES: BACKFILLED WITH 2 BAGS BENTONITE CHIPS; BACKFILLED WITH 3 BAGS CEMENT

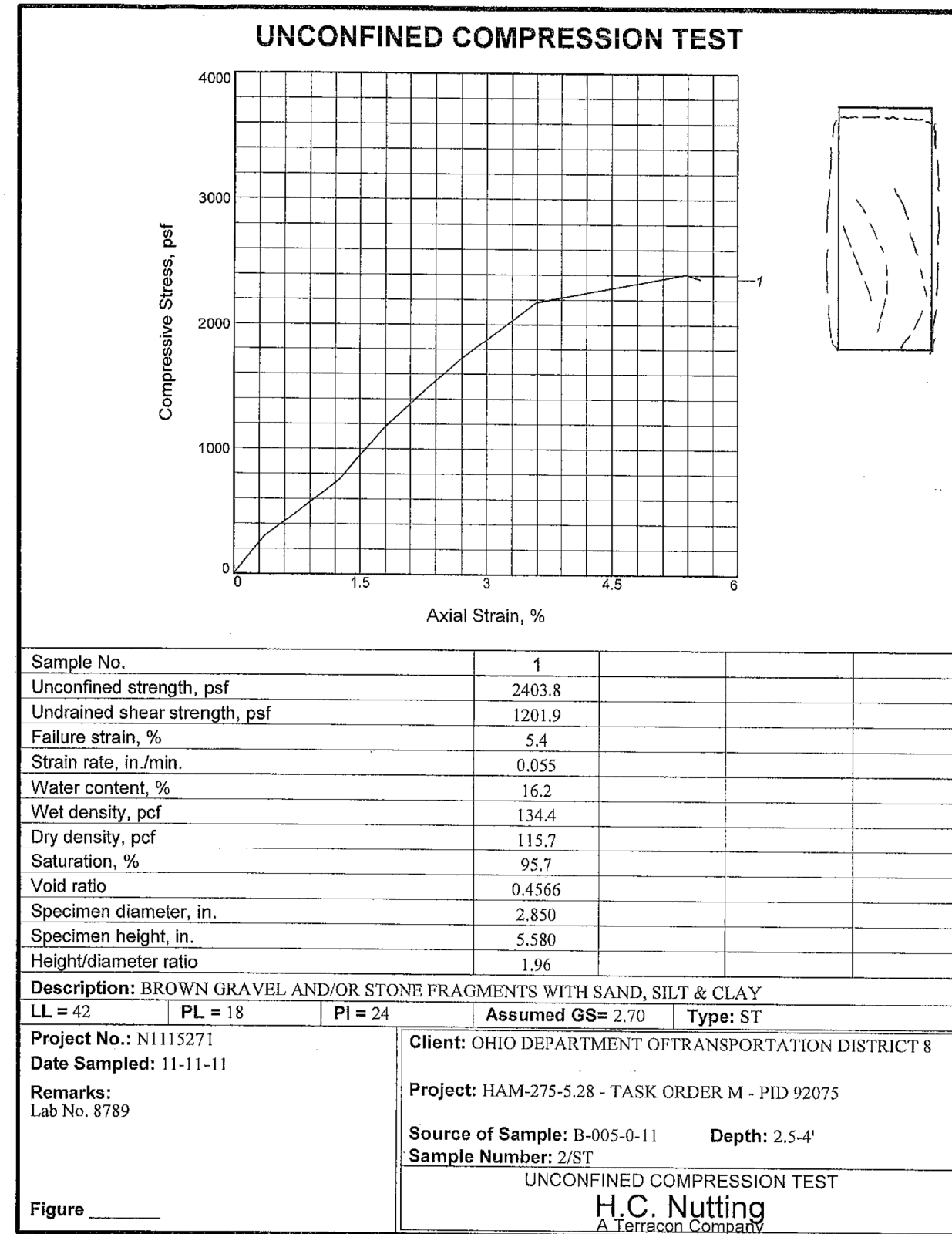
PROJECT: HAM-275-5.28		DRILLING FIRM / OPERATOR: HCN / CJB		DRILL RIG: DIEDRICH D50 TRACK		STATION / OFFSET281+92.83, 195.27 L										EXPLORATION ID					
TYPE: LANDSLIDE		SAMPLING FIRM / LOGGER: HCN / JDD		HAMMER: DIEDRICH AUTOMATIC		ALIGNMENT: I-275										B-005-0-11					
PID: 92075 BR ID:		DRILLING METHOD: 3.25" HSA / NQ2		CALIBRATION DATE: 9/8/10		ELEVATION: 523.1 (MSL) EOB: 25.0 ft.										PAGE					
START: 10/24/11 END: 10/25/11		SAMPLING METHOD: SPT / NQ2		ENERGY RATIO (%): 83.7		COORD: 446085.254 N, 1326311.127 E										1 OF 1					
MATERIAL DESCRIPTION AND NOTES				ELEV.	DEPTHS	SPT/ RQD	N ₆₀	REC SAMPLE (%)	HP (tsf)	GRADATION (%)					ATTERBERG			ODOT CLASS (GI)	HOLE SEaled		
VERY SOFT, DARK BROWN, TRACE DARK GRAY, CLAY, LITTLE TO SOME ORGANICS, TRACE ROOTS, (TOPSOIL), MOIST				523.1		2	4	56	0.25	5	3	7	51	34	50	27	23	30	A-7-6 (15)		
						1															
STIFF, REDDISH-BROWN, GRAVEL AND/OR STONE FRAGMENTS WITH SAND, SILT, AND CLAY, MOIST				521.1																	
LOOSE, REDDISH-BROWN, GRAVEL AND/OR STONE FRAGMENTS WITH SAND, SILT, AND CLAY, MOIST				518.1		4	11	89	-	10	25	37	10	18	36	15	21	16	A-2-6 (1)		
						4															
MEDIUM DENSE, REDDISH-BROWN, COARSE AND FINE SAND, TRACE SILT AND CLAY, MOIST				515.6		3	15	89	-	1	15	63	7	14	NP	NP	NP	12	A-3a (0)		
						4															
MEDIUM DENSE, REDDISH-BROWN, GRAVEL AND/OR STONE FRAGMENTS WITH SAND, SILT, AND CLAY, WET				513.1	W	7	15	89	-	23	29	15	10	23	52	21	31	19	A-2-7 (4)		
VERY STIFF, OLIVE-BROWN, CLAY, LITTLE SHALE SEAMS AND PIECES, TRACE LIMESTONE PIECES, (RESIDUUM), DAMP				510.6	▼	12	33	78	4.00	8	4	5	35	48	48	24	24	22	A-7-6 (15)		
SHALE, GRAY TRACE OLIVE-BROWN, MODERATELY WEATHERED, WEAK, LAMINATED, FISSILE.				508.1	TR	11	85	100	-	-	-	-	-	-	-	-	-	13	Rock (V)		
INTERBEDDED SHALE (95%) AND LIMESTONE (5%); SHALE, GRAY, MODERATELY WEATHERED, WEAK, LAMINATED, CALCAREOUS; LIMESTONE, LIGHT GRAY, SLIGHTLY WEATHERED, MODERATELY STRONG, VERY THIN BEDDED, LOSS 12%.				503.1		18	95	100	-	-	-	-	-	-	-	-	-	13	Rock (V)		
				498.1	EOB	80	88	NQ2-1											CORE		

STANDARD ODOT SOIL BORING LOG (11 X 17) - OH DOT.GDT - 9/17/12 08:42 - N:\PROJECTS\2011\N1115271\WORKING FILES\LABORATORY-FIELD DATA-BORING LOGS\N115271 LANDSLIDE LOGS.GPJ

NOTES: INCLINOMETER SET UPON COMPLETION.
ABANDONMENT METHODS, MATERIALS, QUANTITIES: BACKFILLED WITH 1 BAG BENTONITE CHIPS; BACKFILLED WITH 2 BAGS CEMENT



Tested By: SV _____ Checked By: GS _____



Tested By: SV _____ Checked By: GS _____